

CLAIMS

1. An apparatus for location of an instrument or appliance having at least one magnet which produces a magnetic moment at right angles to the appliance shaft and can be rotated independently of the instrument or appliance.
2. The apparatus as claimed in claim 1, characterized by at least one receiver which detects the three time-dependent magnetic field components $H_x(t)$, $H_y(t)$ and $H_z(t)$.
3. The apparatus as claimed in claim 1 or 2, characterized by an evaluation unit by means of which the position, direction of the appliance shaft and/or roll angle of the appliance can be determined.
4. The apparatus as claimed in one of the preceding claims, characterized by a magnetic field sensor which is attached to the appliance shaft, and a magnet which is separated from the appliance shaft.
5. The apparatus as claimed in one of claims 1 to 3, characterized by an appliance shaft which can rotate and a magnet which is attached to the appliance shaft.
6. The apparatus as claimed in one of the preceding claims, characterized by a drive for the magnet which is independent of the appliance shaft.
7. The apparatus as claimed in claim 6, characterized by an electrical drive for the magnet.
8. The apparatus as claimed in claim 6, characterized by a liquid which drives the magnet.

9. The apparatus as claimed in one of claims 6 to 8, characterized in that the roll angle of the appliance can be measured by means of a further variable component of the magnetic field, which depends on the roll angle.
10. The apparatus as claimed in claim 9, characterized by means for production of reproduceable deflection of the magnet from its rotation axis.
11. The apparatus as claimed in claim 9, characterized by a coupling which temporarily interrupts the rotation of the magnet.
12. The apparatus as claimed in claim 9, characterized by a magnet which is composed of magnet elements that move with respect to one another and whose elements are shifted by a driver at a specific roll angle.
13. The apparatus as claimed in one of the preceding claims, characterized in that the appliance or the appliance tip has a drill, a cutting or impact apparatus, at least one needle or at least one set of forceps.
14. The apparatus as claimed in one of the preceding claims, characterized in that the appliance or the appliance tip has at least one opening for ejection of a liquid.
15. The apparatus as claimed in one of the preceding claims, characterized in that the appliance or the appliance tip has an apparatus for production/emission of light beams, laser beams, radioactive beams, sound waves or ultrasound waves.
16. The apparatus as claimed in one of the preceding claims, characterized in that the appliance or the appliance tip has an apparatus for recording optical images or ultrasound images.

17. The apparatus as claimed in one of the preceding claims, characterized in that the appliance or the appliance tip has an apparatus for emission of electrical pulses or for recording electrical data.
18. The apparatus as claimed in one of the preceding claims, characterized by two or more transmitters and/or receivers.
19. The apparatus as claimed in claim 18, characterized by a permanent magnet and/or electromagnet as the transmitter, and transmitter identification by different frequencies, amplitudes and/or by the production of different analog or digital values.
20. The apparatus as claimed in one of the preceding claims, characterized by modulation of the frequency and/or of the amplitude.
21. The apparatus as claimed in one of the preceding claims, characterized by gradual shielding of a magnet.
22. A method for location of an instrument or appliance, characterized in that at least one magnet, which rotates in the area of the instrument or appliance, produces a magnetic moment at right angles to the body axis, and the three time-dependent magnetic field components $H_x(t)$, $H_y(t)$ and $H_z(t)$ are detected.
23. A method for location of an appliance, characterized by the production of a magnetic moment at right angles to an appliance shaft by means of a rotating magnet, with the magnet, as a transmitter, being connected to the appliance, and with the three time-dependent magnetic field components $H_x(t)$, $H_y(t)$ and $H_z(t)$ being detected by means of a receiver.

24. A method for location of an appliance, characterized by the production of a magnetic moment at right angles to an appliance shaft by means of a rotating magnet, with the magnet, as a transmitter, being connected to the appliance, the three time-dependent magnetic field components $H_x(t)$, $H_y(t)$ and $H_z(t)$ being detected by means of a receiver, and the position, the direction of the appliance shaft and the roll angle of the appliance being determined from this data.
25. The method as claimed in claim 22 or 24, characterized by determination of the distance and direction of two measurement points or measurement areas with respect to one another.
26. The method as claimed in one of claims 22 to 25, characterized by frequency modulation.
27. The method as claimed in claim 26 for frequency-selective amplification, for elimination of disturbance fields, or for distinguishing between different magnetic probes.
28. The method as claimed in one of claims 22 to 27, characterized by an electromagnet and gradual variation of the current supply to an electromagnet, or an electromagnet being switched on and off.

29. Use of the apparatus as claimed in one of claims 1 to 3 or of the method as claimed in one of claims 22 to 28 for one or more of the following purposes: obtaining endoscopic images for diagnostic purposes, obtaining electrical or electrophysiological data, examination of blood vessels and the treatment of vessel constrictions, carrying out and/or monitoring operative actions on the brain, heart or on the intestinal tract, implantation of organ and tissue spare parts, joint prostheses, electromagnetic probes and pulse transmitters, heart pacemakers, vessel spare parts and catheters, removal or destruction of gallstones or kidney stones, inflamed tissue, tumor tissue, bone or joint material, deliberate emission of therapeutic substances to debilitated tissue or tumor tissue, irradiation of tumor tissues, determination of the position, feed axis and roll angle in real time, measurement of the rotation rate or of a change in the rotation rate.
30. Use of the apparatus as claimed in claim 6 or 8 for determination of the flow rate or emission rate of a liquid.